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CROSS-SECTORAL ISSUES, WITH PARTICULAR REFERENCE TO THE CRITICAL ELEMENTS OF SUSTAINABILITY

Note verbale dated 8 April 1996 from the Permanent Mission of the United States of America to the United Nations addressed to the Secretariat of the United Nations

In accordance with General Assembly resolution 49/112 on support for the Global Learning and Observations to Benefit the Environment (GLOBE) Program, the Government of the United States of America is pleased to submit to the secretariat responsible for the Commission on Sustainable Development within the Department for Policy Coordination and Sustainable Development a report on the implementation of the GLOBE Program (see annex).

In its first year of operation, the GLOBE Program has over 30 partner countries involving thousands of students world wide in environmental science and education. We would appreciate the assistance of the United Nations Secretariat in distributing the report to the members of the Commission on Sustainable Development for their consideration at the fourth session of the Commission.

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Annex

Report to the Commission on Sustainable Development on the GLOBE Program

(Global Learning and Observations to Benefit the Environment)

The United Nations General Assembly Resolution 94/112 supporting the GLOBE Program invited Governments to "communicate...to the Commission on Sustainable Development...on their participation in the GLOBE Program." This report is in response to that invitation.

Program Description

The GLOBE Program is a hands-on, international environmental science and education program. The program is school-based, involving both primary and secondary schools. GLOBE brings together students, teachers, and scientists from around the world to enhance the collective awareness of individuals throughout the world concerning the environment, increase scientific understanding of the Earth, and help all students reach the highest standards in science and mathematics education.

Students at all GLOBE schools throughout the world make environmental measurements at or near their schools; report their observations to a GLOBE data processing center; receive and use vivid environmental images created from their data and data from other GLOBE schools around the world; and study the environment by relating their observations and the resulting environmental images to broader environmental topics. All GLOBE activities are conducted under the guidance of GLOBE-trained teachers.

The GLOBE initiative was announced on Earth Day 1994 by U.S. Vice President Al Gore, and the GLOBE Program was initiated on Earth Day 1995. To date, over 30 nations have formally joined the program and approximately 3,000 schools have been identified to participate. In less than one year of operation, over 150,000 elements of environmental data have already been reported. Additional countries are planning to become formal GLOBE partners in the near future and are in the process of negotiating GLOBE agreements with the U.S. Over 100 nations have expressed interest in participating. (List of participating and interested nations is attached.)

U.S. Program

Students at all levels (K-12) in over 2,000 schools in all 50 U.S. states, Puerto Rico and the Marianas Islands are participants in the GLOBE Program. U.S. schools join GLOBE by registering and sending a teacher to a GLOBE teacher training workshop. U.S. GLOBE teacher training workshops are held year-round to prepare teachers to supervise their students' GLOBE activities. The U.S. GLOBE Program is managed as an interagency program involving six U.S. Government agencies, led by the United States National Oceanic and Atmospheric Administration (NOAA). In addition, GLOBE is a public/private partnership involving the Foundation for Global Environmental Education, a private, non-profit foundation. This public/private collaboration seeks to increase private sector support for and involvement in the GLOBE Program, both in the U.S. and internationally.

Partner Country Involvement

As of March 1996, 32 nations throughout the world had joined the GLOBE Program. International participation in GLOBE is conducted through bilateral agreements between the United States and its partner nations. In consultation with its international partners, the U.S. provides the program infrastructure, including development and maintenance of educational materials, scientific protocols and computer and communications systems. Each participating country manages the GLOBE Program in its schools, including ensuring that its schools have scientific instruments for taking GLOBE measurements, and wherever possible, that students have access to classroom computers and Internet communications. However, it is recognized that the diversity of technology accessible by schools worldwide may require, in some cases, that environmental measurements be reported via e-mail or in hardcopy. In the latter case, the nation's GLOBE Country Coordinator is responsible for reporting such schools' measurement data to the GLOBE data processing center via the Internet. In addition to government support, many countries have secured contributions from private corporations and non-profit organizations to provide their schools with the resources necessary to participate in GLOBE.

Networking Student-Scientists

The GLOBE Program promotes international communication, collaboration and understanding among young people throughout the world. Fundamental to the GLOBE Program is the sharing of student-generated environmental data and resulting global images among students and scientists. (Figure 1.) The complete archive of data reported by every GLOBE school is available on the World Wide Web, making the data from, for example, Belgium and the Netherlands, freely and publicly available to all GLOBE students and to the international science community.

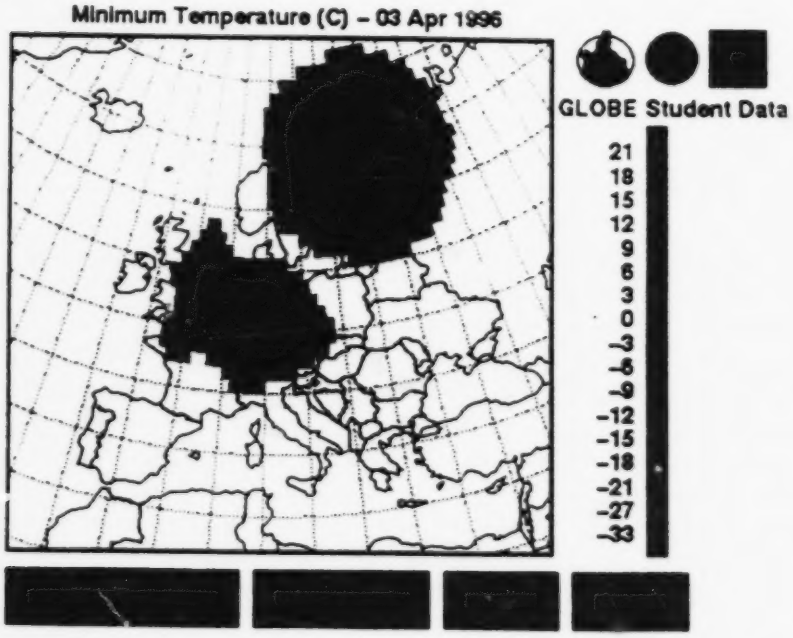

Figure 1

Contour maps are available for all regions providing enough daily measurements to perform the interpolation. Additional regions will be added as we receive enough daily measurements.

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GLOBE provides the opportunity for students to learn about other countries involved in GLOBE. The GLOBE Country Pages on the Student Data Server provide a list of GLOBE schools in each country, information about the GLOBE Points of Contact and Country Coordinators, links to interesting World Wide Web sites about each country, and a gallery of images of each country. For example, Croatia's GLOBE Country Page links to two Web sites developed and maintained by Croatia about its history, culture, and geography. Additionally, if a country has developed its own GLOBE Homepage, it is made accessible by a link from that country's GLOBE Country Page. For example, Germany's GLOBE Homepage includes links to information about various GLOBE events in Germany, information about the sponsoring organization in Germany, and technical guidelines for German GLOBE schools.

Some countries have expanded on the networking nature of GLOBE. Australia, for example, has developed a communications mechanism for GLOBE teachers, called AUSGLOBE, which functions as a simple, informal way for teachers to share information and suggestions relating to GLOBE and for the Country Coordinator to provide updates to Australian GLOBE teachers. The GLOBE Country Coordinator for the Czech Republic has developed a newsletter to keep Czech GLOBE teachers apprised of new developments. Additionally, since many Czech teachers do not have access to the World Wide Web, many global images based on student-derived data are made available in the newsletter.

GLOBE offers an opportunity for international scientists to communicate with students about their research. The Scientist Corner on the GLOBE Student Data Server provides biographical information about each of the GLOBE Principal Investigator scientists and educators, focusing on their areas of research. Additionally, Principal Investigators and other guest researchers develop reports about their areas of study and how the GLOBE measurements contribute to their scientific investigations.

GLOBE fosters regional collaboration through International Training Workshops. Employing a train-the-trainer structure to prepare partner countries for GLOBE implementation, the week-long International Training Workshops bring together Country Coordinators and teachers from one or more regions to prepare them to implement GLOBE in their own countries. For example, the Russian Ministry of Education and the Ministry of Environmental Protection sponsored an International GLOBE Training Workshop for Country Coordinators and teachers from Russia, Kazakstan, Kyrgyzstan, and Moldova. This workshop laid the foundation for future partnerships among workshop participants. Other International Training Workshops have been held in Uruguay for participants from Uruguay, Bolivia, and Argentina; in Senegal for Senegalese and Beninese participants; in the Czech Republic for participants from throughout Europe, Asia and the Middle East; and in Miami, Florida, for participants from many countries including Turkey, China, El Salvador, and Egypt. As a result of these workshops, trainers were prepared to return to their countries to organize and run GLOBE training workshops for their teachers to enable them to supervise their students' GLOBE activities. Such teacher training workshops have been held in over a dozen countries, including Israel, Austria, Finland, and Norway. Several partners, including Greece, Tunisia, and Romania, have identified schools that will participate in the program and plan to attend international training workshops in the near future.

GLOBE also provides an information clearinghouse for interesting GLOBE events around the world. The GLOBE Bulletin on the Student Data Server alerts GLOBE students and teachers to new GLOBE features as well as to current GLOBE-related activities. For example, Argentine President Carlos Menem wrote a letter to all GLOBE students congratulating them for their involvement in the program. This letter was made available to GLOBE students using the GLOBE Bulletin. Additionally, when Irish President Mary Robinson visited Cabinteely Community School in Dublin for a GLOBE demonstration, a GLOBE Bulletin welcomed her to the school and to GLOBE. As new GLOBE partner countries join the program, for example Chad and Morocco, they are welcomed in the GLOBE Bulletin.

GLOBE provides recognition to its schools for exceptional accomplishments. GLOBE STARS recognizes individual schools for reporting data for the first time, for providing large numbers of observations, for doing interesting things in their GLOBE implementation, and for making the news. For example, GLOBE STARS highlighted Japan's 28 schools and Junior Eco Clubs which are reporting GLOBE data on a regular basis. The Junior Eco Clubs are national clubs with over 35,000 student members learning about environmental issues and are a unique aspect of Japan's GLOBE implementation. (Figure 2.) GLOBE STARS also highlighted the first African data reports from Benin. (Figure 3.)

GLOBE STARS

GLOBE STARs in Japan

Japan officially joined the GLOBE program in 1995 and, to date, 21 schools have been identified to participate in GLOBE. In addition, many of the Japanese GLOBE students are part of a national environmental program for young people called Junior Eco Clubs. Over 35,000 students belong to Junior Eco Clubs. In these clubs, young people learn about their environment and how best to take care of it. Seven Junior Eco Clubs have joined GLOBE.

A newspaper in Japan, The Yamanashi Nichinichi Shibun, published a story about the GLOBE activities of students in the Yamanashi Prefecture, a region near Mt. Fuji. The students, featured in the article, are members of the Koufu Junior Eco Club, the Eco Club Oshino, and the Sudama Junior Eco Club. Students began their GLOBE activities by measuring air temperature and water pH in a nearby river. They will be using GLOBEMail to compare their data with Japanese GLOBE students in Istabashi City (pictured here), Fukuoka City, and all over the world.

Figure 2

GLOBE Stars in Benin

Congratulations to Benin, the first GLOBE country on the African continent to begin reporting data! Benin joined GLOBE in April 1995 when the Minister of Education, Mr. Karim Deamene, and then-United States Ambassador to Benin, the Honorable Ruth Davis, signed an agreement in a special ceremony in the capital city, Cotonou.

Beninese teachers, pictured here, were trained in the GLOBE measurements at an August 1995 workshop in Dakar, Senegal and have introduced GLOBE to their students at nine schools throughout this West African country. Students began making observations in December 1995. The first Beninese school to report data, Ecole Primaire Mandina/A, was assisted by the Office of the Mayor of Parakou and the United States Peace Corps.

The Ministry of Education is continuing to oversee development and expansion of the GLOBE program in Benin under the leadership of Mr. Aliyou Bello.

Figure 3

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GLOBE Science

GLOBE students around the world take environmental measurements in the following research areas: Atmosphere/Climate, Hydrology and Soils, and Biology/Land Cover. Following is a list of the initial core GLOBE environmental measurements and the scientific instruments required to make these measurements. As the GLOBE Program evolves, additional measurements will be added to this core list and optional measurements will also be added.

Atmosphere/Climate

Air Temperature	Max/Min Thermometer
Precipitation	Rain Gauge
Cloud Cover/Type	Cloud Charts

Hydrology/Soils

Water pH	pH Paper, pH Pen, or pH Meter
Water Temperature	Thermometer
Soil Moisture	Gypsum Block Sensors and Soil Moisture Meter

Biology/Land Cover

Habitat Study	Compass and Measuring Tape
Tree Height	Clinometer
Tree Canopy	Densiometer
Tree Diameter	Diameter Tape
Species Identification	Dichotomous Keys

The long-term GLOBE science measurements and their accompanying educational activities are designed and developed by nine teams comprised of scientists and educators. The nine Principal Investigator teams are encouraged to include scientists and educators from other countries. In addition, it is anticipated that international scientists will be Principal Investigators for GLOBE measurements expected to be added in the future.

It is important to recognize that real science takes time to develop. GLOBE data has been collected and reported for only one year. However, teams of scientists are already working with the GLOBE data, adding it to other sources of data, and formulating and testing new hypotheses about the environment. GLOBE scientists are confident that the scientific literature will very soon reflect worldwide GLOBE data as a major source of environmental information.

One hundred seventeen countries have expressed interest in GLOBE.
32 countries have signed agreements and joined the Program

Africa (22)

Benin•
Botswana
Cape Verde
Chad•
Côte d'Ivoire
Eritrea
Ethiopia
Gambia
Ghana
Guinea
Kenya
Mali
Mauritania
Namibia
Nigeria
Senegal•
South Africa
Tanzania, United Republic of
Togo
Uganda
Zambia
Zimbabwe

Asia and the Pacific (22)

Australia•
Bangladesh
Brunei Darussalam
China•
Hong Kong
India
Indonesia
Japan•
Korea, Republic of•
Lao People's Democratic Republic
Malaysia
Marshall Islands
Micronesia (Federated States of)
Mongolia
Nepal
New Zealand
Pakistan
Papua New Guinea
Philippines
Sri Lanka
Taiwan Province of China
Thailand

Central and South America (19)

Argentina•
Bahamas
Barbados
Bolivia•
Brazil
Chile
Costa Rica
Dominican Republic
Ecuador
El Salvador•
Guatemala
Honduras
Nicaragua
Panama
Peru
Suriname
Trinidad and Tobago
Uruguay•
Venezuela

Middle East and North Africa (10)

Egypt•
Israel•
Jordan
Kuwait
Morocco•
Oman
Syrian Arab Republic
Tunisia•
United Arab Emirates
Yemen

North America (2)

Canada
Mexico

Europe (42)

Armenia
Austria•
Azerbaijan
Belarus
Belgium•
Bulgaria
Croatia•
Cyprus
Czech Republic•
Denmark
Estonia
Finland•
France
Georgia
Germany•
Greece•
Hungary
Iceland
Ireland•
Italy
Kazakstan•
Kyrgyzstan•
Latvia
Lithuania
Luxembourg
Moldova•
Netherlands•
Norway•
Poland
Portugal
Romania•
Russian Federation•
Slovakia
Slovenia
Spain
Sweden•
Switzerland
Tajikistan
Turkey•
Ukraine
United Kingdom of Great Britain and Northern Ireland
Uzbekistan

• Signed GLOBE Agreement (revised 27 March 1996)